

CLAIMS

1. A process for preparing functionalized polyorganosiloxane (POS) resins comprising units M:

5 (R<sub>3</sub>SiO<sub>1/2</sub>), Q: (SiO<sub>4/2</sub>) and M': (Y<sub>a</sub>R<sub>3-a</sub>SiO<sub>1/2</sub>) and optionally D: (R<sub>2</sub>SiO<sub>2/2</sub>) and/or D': (RYSiO<sub>2/2</sub>) and T: (RSiO<sub>3/2</sub>) and/or T': (YSiO<sub>3/2</sub>),

with, in these units:

- the radicals R, which may be identical or  
10 different, representing a C<sub>1</sub>-C<sub>10</sub> alkyl or a C<sub>8</sub>-C<sub>12</sub> aryl,

- the radicals Y being identical or different and representing a functional group Y,  
by redistribution of POS resins using POSf bearing  
15 functional units M' and/or D' and/or T', as defined above, in the presence of an acid catalyst, said process being characterized in that at least one catalyst is used of formula (I) below:

20 (I) (C<sub>m</sub>F<sub>2m+1</sub>SO<sub>2</sub>)<sub>n</sub>A

in which:

Δ m is an integer greater than or equal to  
1;

25 Δ n is an integer equal to 1 or 2 and A represents NH<sub>2</sub> or NH with:

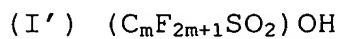
(i) n = 1 and A = NH<sub>2</sub> or NHR with R

being a radical of  $\text{SO}_2\text{-Z}$  type with Z

being a group other than  $\text{C}_m\text{F}_{2m+1}$

(ii)  $n = 2$  and  $A = \text{NH}$ .

2. The process as claimed in claim 1,  
 5 characterized in that a mixture of catalysts is  
 employed comprising at least one catalyst of  
 formula (I) and at least one catalyst of formula (I')  
 below:



10 in which m is an integer greater than or equal to 1.

3. The process as claimed in claim 1,  
 characterized in that Y is chosen from the group  
 comprising:

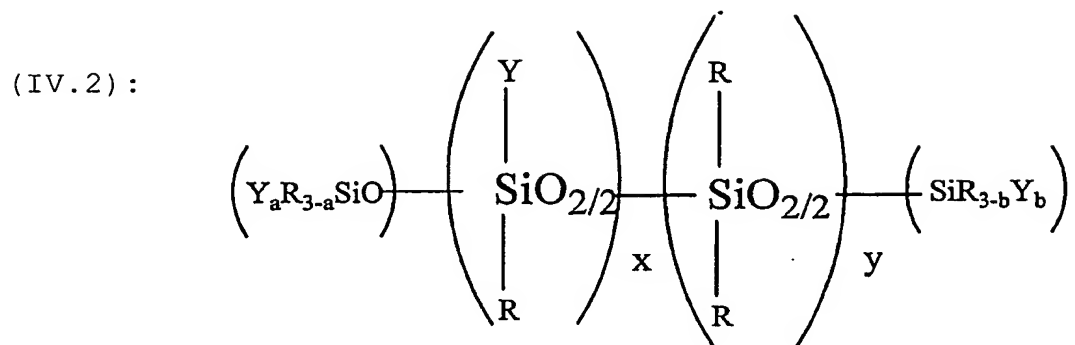
- hydrogen
- 15 • an alkenyl
- an alkynyl
- an aryl (preferably a phenyl)
- an (alkyl)epoxy
- an ether or a polyether
- 20 • a carboxylic acid
- an amide
- an amine
- a halide
- an alcohol
- 25 • a thiol or any other sulfur derivative.

4. The process as claimed in claim 1,  
 characterized in that the POSfs bearing functional

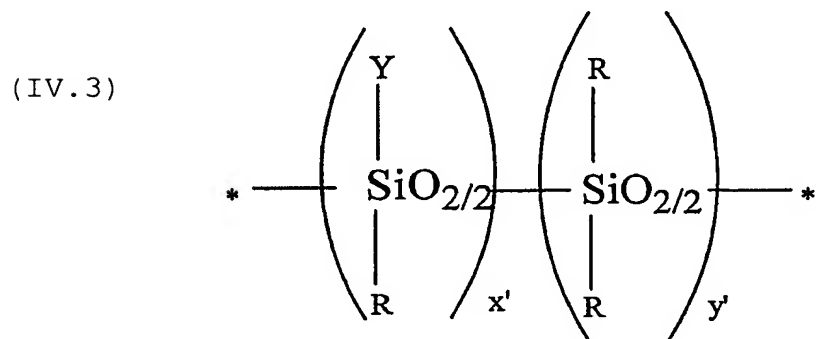
units M' and/or D' and/or T', which are useful for the redistribution, are those of formula (IV.1), (IV.2) or (IV.3) below:



or



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in which:

- Y and R are as defined above,
- 15 - a and b = 0 to 2,
- $0 \leq x \leq 200$ ,
- $0 \leq y \leq 200$ ,

- with the condition that if  $x + y = 0$ , then  $a$  and/or  $b \neq 0$ ,
- $1 \leq x' \leq 10$ ,
- $0 \leq y' \leq 10$ ,
- 5        -  $3 \leq x' + y' \leq 10$ .

5. The process as claimed in claim 1, characterized in that the catalyst is trifluoromethanesulfonamide acid (TFSI) of formula (I) (ii) with  $m = 1$ .

10        6. The process as claimed in claim 1, characterized in that the concentration of acid catalyst (I) is between 1 ppm and 2% by weight relative to the starting resin and in that the catalyst (I)/inert support mass ratio is between 0.1 and 10.

15        7. The process as claimed in claim 1, characterized in that it comprises the following essential steps:

- 1- combining the starting POS resin, the POSf bearing functional units, the acid catalyst  
20        (I), in an organic solvent;
- 2- reacting preferably at a temperature  $\theta_r$  greater than or equal to room temperature and less than or equal to the boiling point of the solvent, and even more preferably between  
25        50°C and 100°C;
- 3- optionally quenching the reaction by adding an agent for neutralizing the acid catalyst

(I);

- 4- removing the inert filler (advantageously the carbon black) from the reaction medium, preferably by filtration.

5           8. The process as claimed in claim 7, characterized in that the organic solvent, preferably xylene or toluene, is provided in the reaction medium by means of a solution of starting POS resin in said solvent.

10           9. The process as claimed in claim 1, characterized in that  $Y = H$  or alkenyl in the functional units  $M'$  and/or  $D'$  and/or  $T'$  of the POSf, and in that, after the redistribution, other functionalization radicals  $Y_1$  bearing at least one  
15 unsaturation (preferably ethylenic) or at least one Si-H unit are grafted onto the  $\equiv Si-H$  or  $\equiv Si$ -alkenyl units, respectively, of the redistributed resin.

          10. The process as claimed in claim 1, characterized in that the redistributed and  
20 functionalized resin obtained is subjected to at least one other redistribution/functionalization, using POSfs bearing functional units.

          11. Catalytic system for preparing functionalized polyorganosiloxane (POS) resins  
25 comprising units  $M: (R_3SiO_{1/2})$ ,  $Q: (SiO_{4/2})$  and  $M': (Y_aR_{3-a}SiO_{1/2})$  and optionally  $D: (R_2SiO_{2/2})$  and/or  $D': (RYSiO_{2/2})$  and/or  $T: (RSiO_{3/2})$  and/or  $T': (YSiO_{3/2})$  with, in these

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- 10

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in which:

$\Delta$  m is an integer greater than or equal to 1;

$\Delta$      $n$  is an integer equal to 1 or 2 and  $A$   
represents  $\text{NH}_2$  or  $\text{NH}$  with:

(i)     $n = 1$  and  $A = \text{NH}_2$  or  $\text{NHR}$  with  $R$  being a  
         radical of  $\text{SO}_2\text{-Z}$  type with  $Z$  being a  
5           group other than  $\text{C}_m\text{F}_{2m+1}$

(ii)  $n = 2$  and  $A = \text{NH}$ .